

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended): An improved method for providing computer understanding by generating computer instructions from a free continuous speech natural language dialog, comprising:

receiving a symbolic representation of a free continuous speech natural language utterance, comprising at least one of sound segments corresponding to words or phrases having the same meaning as other words or phrases corresponding to different sound segments, respectively, sound segments corresponding to words or phrases having different spellings and different meanings, sound segments corresponding to words or phrases having the same spellings and different meanings, or sound segments corresponding to words or phrases having a meaning that is subject area dependent;

parsing said symbolic representation of said free continuous speech natural language utterance into parsed information;

entering said parsed information into a computer instruction generator, wherein said computer instruction generator is adapted to receive inputs from a hierarchically organized context-sensitive dictionary system comprising a context-sensitive subject area dictionary system, a context-sensitive program module subdictionary system, a context-sensitive argument subdictionary system, and a context-sensitive value subdictionary system and wherein said context-sensitive subject area dictionary system comprises data organized in a plurality of subject areas, said context-sensitive program module subdictionary system comprises data organized in a plurality of program modules for each of said subject areas, said context-sensitive argument subdictionary system comprises data organized in a plurality of arguments for each of said program modules and said context sensitive value subdictionary system comprises data organized in a plurality of values for each of said arguments;

determining, by accessing said context-sensitive subject area dictionary system, a subject area identifier for a subject area of said parsed information;

determining, by accessing said context-sensitive program module subdictionary system, a module identifier for a program module of said subject area based upon the determined subject area identifier and the parsed information;

determining, by accessing said context-sensitive argument subdictionary system, an argument identifier for an argument of said program module based upon the determined module identifier and the parsed information;

determining, by accessing said context-sensitive value subdictionary system, a value identifier for a value of said argument based upon the determined argument identifier and the parsed information; and

producing computer instructions based upon the subject area identifier, module, the module identifier, the argument identifier and the value identifier, such that the free continuous speech natural language utterance is processed by the computer.

2. (previously presented): The method of Claim 1 wherein said subject area comprises a plurality of sub-subject areas and the context-sensitive subject area dictionary system further comprises a context-sensitive sub-subject area subdictionary for each of said sub-subject areas.

3. (original): The method of Claim 1 wherein determining a value identifier further comprises querying the computer system for a missing value identifier.

4. (original): The method of Claim 1 wherein determining a subject area identifier further comprises querying a user of the computer system for a missing subject area identifier;

determining a module identifier further comprises querying a user of the computer system for a missing module identifier; and

determining a value identifier further comprises querying a user of the

computer system for a missing value identifier.

5. (original): The method of Claim 1 wherein
 - determining a subject area identifier further comprises using a previously determined value for a missing subject area identifier;
 - determining a module identifier further comprises using a previously determined value for a missing module identifier; and
 - determining a value identifier further comprises using a previously determined value for a missing value identifier.

6. (withdrawn): A method for determining an appropriate program module selection for processing a natural language dialog in a computer system for processing natural language, comprising:

- capturing a set of successfully understood natural language dialogs and associated program modules used to produce computer understanding;
 - analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;
 - storing the frequency of occurrence values in a matrix; and
 - determining, using the matrix, the appropriate program module selection based on choosing program modules having non-zero frequency value entries in the matrix.

7. (withdrawn): The method for Claim 6 further comprising:

- capturing a step associated with the program modules as executed within the natural language dialogs;
 - analyzing the captured program module information to determine a frequency of occurrence value, for each of the steps in the dialog, for proceeding to a next program module from a current program module;
 - storing the frequency of occurrence values and step information in a matrix; and
 - determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero

frequency value entries in the matrix.

8. (withdrawn): The method for Claim 6 further comprising:

capturing grouping information for the program modules as executed within the natural language dialogs;

analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;

storing the frequency of occurrence values and the grouping information in a matrix; and

determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.

9. (currently amended): An improved apparatus providing computer understanding by generating computer instructions from a free continuous speech natural language dialog, comprising:

a receiver receiving a symbolic representation of a free continuous speech natural language utterance comprising at least one of sound segments corresponding to words or phrases having the same meaning as other words or phrases corresponding to different sound segments, respectively, sound segments corresponding to words or phrases having different spellings and different meanings, sound segments corresponding to words or phrases having the same spellings and different meanings, or sound segments corresponding to words or phrases having a meaning that is subject area dependent;

a parser parsing said symbolic representation of said free continuous speech natural language utterance into parsed information;

a hierarchically organized context-sensitive dictionary system comprising

a context-sensitive subject area dictionary system comprising data organized in a plurality of subject areas, wherein said context sensitive subject area dictionary system is used to determine a subject area identifier for a subject area of said parsed information;

a context-sensitive program module subdictionary system comprising data organized in a plurality of program modules for each of said subject areas and wherein said context-sensitive program module subdictionary system is used to determine a module identifier for a program module of said subject area based upon the determined subject area identifier and the parsed information;

a context-sensitive argument subdictionary system comprising data organized in a plurality of arguments for each of said program modules and wherein said context-sensitive argument subdictionary system is used to determine an argument identifier for an argument of said program module based upon the determined module identifier and the parsed information;

a context-sensitive value subdictionary system comprising data organized in a plurality of values for each of said arguments and wherein said context-sensitive argument subdictionary system is used to determine a value identifier for a value of said argument based upon the determined argument identifier and the parsed information; and

computer instructions produced based upon sequential determination of the subject area identifier, module, the module identifier, the argument identifier and the value identifier, such that the free continuous speech natural language utterance is processed by the computer.

10. (previously presented):The apparatus of Claim 9 wherein said subject area comprises a plurality of sub-subject areas and the context-sensitive subject area dictionary system further comprises a context-sensitive sub-subject area subdictionary system for each of said sub-subject areas.

11. (original):The apparatus of Claim 9 wherein undetermined value identifiers are determined by querying the computer system for a missing value identifier.

12. (original):The apparatus of Claim 9 wherein:
undetermined subject area identifiers are determined by querying a user of the

computer system for a missing subject area identifier;

undetermined module identifiers are determined by querying a user of the computer system for a missing module identifier; and

undetermined value identifiers are determined by querying a user of the computer system for a missing value identifier.

13. (original): The apparatus of Claim 9 wherein

undetermined subject area identifiers are determined using a previously determined value for a missing subject area identifier;

undetermined module identifiers are determined using a previously determined value for a missing module identifier; and

undetermined value identifiers are determined using a previously determined value for a missing value identifier.

14. (withdrawn): An apparatus determining an appropriate program module selection for processing a natural language dialog in a computer system for processing natural language, comprising:

a set of successfully understood natural language dialogs and associated program modules used to produce computer understanding;

an analyzer analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values; and

a logic unit determining, using the matrix, the appropriate program module selection based on choosing program modules having non-zero frequency value entries in the matrix.

15. (withdrawn): The apparatus of Claim 14 further comprising:

a step identifier, associated with the program modules as executed within the natural language dialogs;

an analyzer analyzing the captured program module information to determine a

frequency of occurrence value, for each of the steps identified in the dialog, for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values and step information; and
a logic unit determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero frequency value entries in the matrix.

16. (withdrawn): The apparatus of Claim 14 further comprising:

a grouping identifier for the program modules as executed within the natural language dialogs;
an analyzer analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values and the grouping information; and

a logic unit determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.

17. (currently amended): An improved apparatus for providing computer understanding by generating computer instructions from a free continuous speech natural language dialog, comprising:

a means for receiving a symbolic representation of a free continuous speech natural language utterance comprising at least one of sound segments corresponding to words or phrases having the same meaning as other words or phrases corresponding to different sound segments, respectively, sound segments corresponding to words or phrases having different spellings and different meanings, sound segments corresponding to words or phrases having the same spellings and different meanings, or sound segments corresponding to words or phrases having a meaning that is subject area dependent;

a means for parsing said symbolic representation of said free continuous speech

natural language utterance into parsed information;

a means for determining, by accessing a context-sensitive subject area dictionary system, a subject area identifier for a subject area of said parsed information, wherein said context-sensitive subject area dictionary system comprises data organized in a plurality of subject areas;

a means for determining, by accessing a context-sensitive program module subdictionary system, a module identifier for a program module of said subject area based upon the determined subject area identifier and the parsed information, wherein said context-sensitive program module subdictionary comprises data organized in a plurality of program modules for each of said subject areas;

a means for determining, by accessing a context-sensitive argument subdictionary system, an argument identifier for an argument of said program module based upon the determined module identifier and the parsed information, wherein said context-sensitive argument subdictionary comprises data organized in a plurality of arguments for each of said program modules;

a means for determining, by accessing a context-sensitive value subdictionary system, a value identifier for a value of said argument based upon the determined argument identifier and the parsed information, wherein said context-sensitive value subdictionary comprises data organized in a plurality of values for each of said argument; and

a means for producing computer instructions based upon sequential determination of the subject area identifier, module, the module identifier, the argument identifier and the value identifier, such that the free continuous speech natural language utterance is processed by the computer.

18. (currently amended):A computer program product comprising:
 - a computer -readable memory device for providing computer understanding by generating computer instructions from a free continuous speech natural language dialog;
 - a set of computer program instructions stored on the computer - readable memory device, including instructions to:

receive a symbolic representation of a free continuous speech natural

language utterance comprising at least one of sound segments corresponding to words or phrases having the same meaning as other words or phrases corresponding to different sound segments, respectively, sound segments corresponding to words or phrases having different spellings and different meanings, sound segments corresponding to words or phrases having the same spellings and different meanings, or sound segments corresponding to words or phrases having a meaning that is subject area dependent;

parse said symbolic representation of said free continuous speech natural language utterance into parsed information

determine, by accessing a context-sensitive subject area dictionary system a subject area identifier for a subject area of said parsed information, wherein said context-sensitive subject area dictionary system comprises data organized in a plurality of subject areas;

determine, by accessing a context-sensitive program module subdictionary, a module identifier for a program module of said subject area based upon the determined subject area identifier and the parsed information, wherein said context-sensitive program module subdictionary system comprises data organized in a plurality of program modules for each of said subject areas;

determine, by accessing a context-sensitive argument subdictionary system, an argument identifier for an argument of said program module based upon the determined module identifier and the parsed information, wherein said context-sensitive argument subdictionary system comprises data organized in a plurality of arguments for each of said program modules;

determine, by accessing a context-sensitive value subdictionary system, a value identifier for a value of said argument based upon the determined argument identifier and the parsed information, wherein said context-sensitive value subdictionary system comprises data organized in a plurality of values for each of said arguments; and

produce computer instructions based upon sequential determination of the subject area identifier, module, the module identifier, the argument identifier and the value identifier, such that the free continuous speech natural language utterance is processed by the computer.

19. (currently amended): A computer data signal transmitted via a carrier wave and stored in a computer readable memory device comprising a code segment for providing computer understanding by generating computer instructions from a free continuous speech natural language dialog, the code segment including instructions to:

receive a symbolic representation of a free continuous speech natural language utterance comprising at least one of sound segments corresponding to words or phrases having the same meaning as other words or phrases corresponding to different sound segments, respectively, sound segments corresponding to words or phrases having different spellings and different meanings, sound segments corresponding to words or phrases having the same spellings and different meanings, or sound segments corresponding to words or phrases having a meaning that is subject area dependent;

parse said symbolic representation of said free continuous speech natural language utterance into parsed information;

determine, by accessing a context-sensitive subject area dictionary system, a subject area identifier for a subject area of said parsed information, wherein said context-sensitive subject area dictionary system comprises data organized in a plurality of subject areas;

determine, by accessing a context-sensitive program module subdictionary system, a module identifier for a program module of said subject area based upon the determined subject area identifier and the parsed information, wherein said context-sensitive program module subdictionary system comprises data organized in a plurality of program modules for each of said subject areas;

determine, by accessing a context-sensitive argument subdictionary system, an argument identifier for an argument of – said program module based upon the determined module identifier and the parsed information, wherein said context-sensitive argument subdictionary system comprises data organized in a plurality of arguments for each of said program modules;

determine, by accessing a context-sensitive value subdictionary system, a value identifier for a value of said argument based upon the determined argument identifier and the parsed information, wherein said context sensitive value subdictionary system

comprises data organized in a plurality of values for each of said arguments; and produce computer instructions based upon sequential determination of the subject area identifier, module—the module identifier, the argument identifier and the value identifier, such that the free continuous speech natural language utterance is processed by the computer.

20. (new): The method of claim 1 further comprising:

capturing a set of successfully understood free continuous speech natural language dialogs and associated program modules used to produce computer understanding;

analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;

storing the frequency of occurrence values in a matrix; and

determining, using the matrix, the appropriate program module selection based on choosing program modules having non-zero frequency value entries in the matrix.

21. (new): The method for Claim 20 further comprising:

capturing a step associated with the program modules as executed within the free continuous speech natural language dialogs;

analyzing the captured program module information to determine a frequency of occurrence value, for each of the steps in the dialog, for proceeding to a next program module from a current program module;

storing the frequency of occurrence values and step information in a matrix; and

determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero frequency value entries in the matrix.

22. (new): The method for Claim 20 further comprising:

capturing grouping information for the program modules as executed within the free continuous speech natural language dialogs;

analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;

storing the frequency of occurrence values and the grouping information in a matrix; and

determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.

23. (new): The apparatus of Claim 9 further comprising:

a set of successfully understood free continuous speech natural language dialogs and associated program modules used to produce computer understanding;

an analyzer analyzing the captured program module information to determine a frequency of occurrence value for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values; and

a logic unit determining, using the matrix, the appropriate program module selection based on choosing program modules having non-zero frequency value entries in the matrix.

24. (new): The apparatus of Claim 23 further comprising:

a step identifier, associated with the program modules as executed within the free continuous speech natural language dialogs;

an analyzer analyzing the captured program module information to determine a frequency of occurrence value, for each of the steps identified in the dialog, for proceeding to a next program module from a current program module;

a matrix storing the frequency of occurrence values and step information; and

a logic unit determining, using the matrix, the appropriate program module selection based on choosing program modules with matching step information and having non-zero frequency value entries in the matrix.

25. (new): The apparatus of Claim 23 further comprising:

- a grouping identifier for the program modules as executed within the free continuous speech natural language dialogs;
- an analyzer analyzing the captured program module information to determine a frequency of occurrence value, for each of the groupings, for proceeding to a next program module from a current program module;
- a matrix storing the frequency of occurrence values and the grouping information; and
- a logic unit determining, using the matrix, the appropriate program module selection based on choosing program module groupings having non-zero frequency value entries in the matrix.